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A SCHEME OF MEDICAL TUITION.

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Dedication.

TO

GEORGE BURROWS, Esq., M.D., F R.S.,

PRESIDENT OF THE GENERAL COUNCIL OF MEDICAL EDUCATION,

WHO HAS THROUGH LIFE BEEN THE

ABLE AND CONSISTENT ADVOCATE OF ANY CHANGE WHICH COULD ADVANCE

THE EDUCATION, UTILITY, AND STATUS OF THE

MEDICAL PROFESSION,

THESE FEW PAGES ARE DEDICATED.

A SCHEME OF MEDICAL TUITION.

AN important Association of the London Teachers of Medicine has lately been formed for the purpose of improving medical tuition. It is to be hoped that this Association is preliminary to a larger organisation, which will include all the teachers in the United Kingdom. The changes in the system of medical tuition which are absolutely necessary in several subjects can only be brought about by some co-operative movement. The Medical Council might indeed do much, but it can hardly act efficiently if it is not supported by public opinion and urged on by public pressure. If the Association of Medical Teachers would review the whole course of medical tuition; if they would prepare and agree on a report embodying all the desiderata; and if, sinking minor differences of opinion, they would unanimously determine vigorously to carry out their own programme, they would supply a basis for action, or at any rate for general discussion, which would terminate in action.

It is with the hope of contributing to such a report that, as an old London teacher, who has been engaged in teaching different subjects for twenty years, and as an examiner in medicine of nearly fifteen years' standing, I am desirous of stating the kind of tuition and the succession of subjects which I believe would be the best for students intended for general practice.

A young man of seventeen or eighteen years of age passes his preliminary examination in general education, and has then four years to study before he can obtain a diploma admitting him to general practice. He is necessarily profoundly ignorant of all the subjects he is about to study, for it is futile to suppose we can ever insist on a special scientific education for those who desire to enter the medical profession. We can only demand evidence that he has had a good general education, as usually understood in this country.

It is becoming the custom in England to pass either the whole or the first three of these four years at a medical school. The regulations of the English licensing bodies permit, however, a different course. After the entrance examination has been gone through, one year or eighteen months are permitted to be passed in the surgery of a recognised medical practitioner. This is an unfortunate permission, and is inconsistent with the scheme of education adopted by the Medical Council. If we mean anything by our rules, we mean that a knowledge of medicine, surgery, and midwifery can be acquired with difficulty, and imperfectly, without a knowledge of anatomy, physiology, and chemistry. This permission surrenders the groundwork of our rules, and puts the pyramid on its apex. It also heightens the uncertainty of tuition, since it is clear that the chances of acquiring knowledge must be greater in a medical school than in the surgeries of busy practitioners, who sometimes want the inclination, often the time, always the means, of instructing their pupils in those branches of knowledge which underlie medical science. Happily this modified apprenticeship is becoming less and less common. It is for the most part a mere waste of time, and occasionally is worse even than this; logically judged, it is indefensible, and from experience is hurtful. It can never hold its ground before the necessity of teaching not only thoroughly, but quickly. Our students have only a certain capital in time, and cannot afford to place it at such low interest.

I. THE FIRST TWO YEARS.

The medical year is differently divided in the several parts of the kingdom. The English division of a six months' winter, and a three months' summer course appears less convenient than a division into five months' winter and four months summer session would be. If the time-honoured custom in England of commencing the winter session in October be adhered to, the session should end with February, and the summer session should begin in April and end with July. At present some subjects are taught too lengthily, others too briefly. Some change in the order of the subjects seems necessary. The *annus medicus* begins in October or in November, and the first winter session is ordered by almost all the curricula to be occupied by the study of chemistry and anatomy. To these subjects some add physiology, but I believe that it would be good policy to occupy the whole of the first winter session with the two first-named subjects alone. In chemistry, a winter of formal lectures is followed by a summer of practical work. Although the teachers are the first chemists of the day, the results as regards the mass of students are certainly not satisfactory. I do not speak now of the best men, to whom most teachers almost instinctively turn as showing the effect of their teaching, but of the average body of students who go up to the English licensing bodies. The amount of knowledge is not great, and it is almost always book-learning. The practical course appears to be in most schools ineffective, while in some it must be looked upon merely as a form. I believe that this is the first point of the educational course the Association should consider.

I would suggest that the leading chemical teachers should be invited to form a committee for the purpose of advising the Association. I think it possible such a committee would reverse the order of teaching and commence with the practical work. What appears, indeed, to be the best way of gradually initiating these young men (who are all ignorant of chemistry) into what is in its early stages a difficult subject? Would it not be much better to begin at once with practical teaching, making every student perform the experiments which would lead him on step by step,

and give him sure ground at every point ; and then, when he had some idea of elementary points, to explain in a few clear lectures the generalisations which bind together and explain the scattered facts he has practically learnt ?

What would be wanted for such a course ? Laboratories, which are supposed already to exist ; apparatus and tests, which would not be costly ; a carefully-prepared official text-book, current in all schools, arranged with daily lessons so as to form a series of steps ; some simple directions given at the commencement of each day's work, and a general superintendence which would be easy on the part of the teacher and his assistants. If a winter session lasted for five months, and if two hours daily were given to the laboratory work, a sound chemical foundation would belaid which a student would never forget, for he would have made every fact his own. At a certain period in this course, say after three months had elapsed, a formal lecture by the teacher for five days in the week during two months would perhaps be sufficient in the present state of chemistry to give the student a clear though brief epitome of the philosophy of the science.

Apart from the comparative ease of learning the subject in this way, two points would be gained. There would be no difficulty in the teacher assuring himself that the work had been done. A glance almost would show him how the student was spending his time in the laboratory : and if one day per week out of the six were assigned for a practical examination of the week's work, the progress of the student could not escape being measured. A compulsory written examination at the end of each month's formal lectures would test the attainments of that part of the course, and would not be too great labour for the teacher. The second gain would be, that uniformity would be introduced into the teaching ; that every student would know exactly what he had to do, and every examining body would see the limits within which their examination must fall. I know, however, that this last point, which to me appears such a gain, would be differently viewed by others, who would object that a selection of study and a limitation of examination must be bars to progress. On this point I shall have to remark hereafter.

If some scheme like this were adopted, the student in his first winter session should work at first for two, and then for the last

two months for three, hours daily at chemistry. He would have in all (examinations being reckoned) 110 to 120 practical lessons, and his progress would have been tested at every step.

Anatomy should be the other subject studied in the first winter session. Anatomy has always been better learnt than any other part of medical education, simply because it has been more practically taught. The usual method is for the teacher to lecture once daily to the class for an hour, showing dissections and organs on the dead body. Of late years, owing to the practical examinations of the College of Surgeons, small classes are often taught by demonstrators by the aid of recent dissections. According to the supply of subjects, each student himself dissects more or less; but a minimum of dissection is required by the regulations. The plan is not economical of time; for, if a student has no dissection, he often does nothing more than attend the hourly lecture, and read privately more or less diligently. The lecture also, especially for a large class, is often not effective; the parts cannot be well seen by many, and the rapidity with which the lesson is often gone over is very embarrassing to a beginner.

Can nothing be done to make the teaching still more effective? If two hours daily are occupied with chemistry, we might surely demand that three hours should be given to anatomy. Could not a complete tutorial scheme be throughout adopted, and classes of limited numbers be formed, directed it may be by the demonstrators or older students, and superintended by the teacher, in which, commencing with the bones in their hands, and then passing on to the soft parts, the student should go over and over again the important practical points?

The modes of preserving bodies, by which a dissection can be kept fresh for a long time, would seem to render the procuring of materials for such classes very easy. Then, when subjects could be procured, the student might be taken from his class and be put to dissection, which would be merely another phase of the same work. During the first three months, three or four hours might be given to anatomy, making the entire day's work in the school to last for six hours. During the time of dissection, one or even two more hours' work daily might be demanded. In this way, again, no student could escape being present and learning; or if he remained ignorant he would be detected, and not allowed to move onward.

The labour involved in this work would not be greater than it now is, as most anatomical teachers spend several hours daily in their dissecting rooms.

An authorised and official text-book for all schools is not so much needed for anatomy as for chemistry; the subject is less extensive, less changeable, and there is more agreement as to its limits. But it may be suggested whether the teachers could not more definitely agree as to what medical students want.

An extreme prominence is given by some teachers to minute points which are of no real practical value, and which the student learns only to forget. Others spend much time on transcendental questions of analogies and developments. The end, however, of the tuition must be kept in view; the time is limited, and the knowledge must be so also; but though limited, it should be thorough, and should be practical—that is, should have a direct bearing on future work.

At the end of the first winter session, at the cost of six hours' daily work, with additional private reading and preparation, I conceive any student should have a fair and accurate knowledge of chemistry and anatomy; and his attendance and industry would have been overlooked and tested far better than it is now. He will, however, have finished with neither subject.

The first summer session would occupy four months—April to July inclusive; and I conceive that in this time four subjects should be gone through—namely, toxicological chemistry, *materia medica*, botany, and physics.

The subjects now included in the course of forensic medicine must undoubtedly be divided; and it is on the whole most advantageous, I believe, to let the practical toxicological part—that is, the chemical examination for poisons—follow immediately after the practical chemical course. Daily laboratory work, during the entire session, of one hour and a half ought to make the student thoroughly acquainted with the tests for poisons. The important section of the micro-chemistry of poisons could be gone through towards the end of the course, or preferably in the following summer session.

The present course of *materia medica* and therapeutics should be divided. *Materia medica*—that is, simply the account of the drugs and preparations named in the Pharmacopœia, or supposed to be worthy of being included—should, like anatomy, be taught

tutorially. I have had some experience in this matter, and I believe that if every student has the drugs placed in his hand, is made to observe them carefully so as to recognise them at once, and is then obliged to read out of his text-book their origin, place of supply, chief preparations, doses, &c., the whole of this usually dry subject could be even agreeably learnt in four months, by a daily lecture of one hour and a half. There should be little formal lecturing, but constant questioning by the teacher, and replies by the student. Three or four drugs and their preparations could easily be got over every day; and if the work was not satisfactory, the same drugs could be afterwards returned to. The weekly practical examination would test the student's progress. For such a course as this, a large quantity of some drugs and preparations would be necessary; but this would entail little expense. All therapeutical discussion should be avoided.

Botany should be taught during this session, and, perhaps, with a good text-book, a lecture of one hour daily for three days in the week would be sufficient. I believe an authorised small text-book, written with special reference to medical teaching, is most desirable.

The other subject on which I think special instruction should be given is physics, which is now in part included in the course on chemistry. Mechanics and dynamics to a certain extent; the laws of heat, light, electricity, &c., their manifestations in the body, &c., are so important to medical men, that it seems desirable to bring the teaching of these subjects into greater prominence, and to separate them from chemistry properly so called. This course should be demonstrative to a great extent, but could not, perhaps, be experimentally worked at by the students. A compulsory written examination at the end would, therefore, be necessary. Probably three lectures a week, alternating with the botanical lectures, would be sufficient; but the length of this course would require careful consideration. The whole daily work would be four hours, in addition to private study, and additional practical botanical work whenever it could be undertaken.

Authorised text-books would be wanted for botany and physics. The examination of poisons and the enumeration of drugs are so completely given in many works that it would hardly seem necessary to have special works prepared for these subjects. The Pharmacopœia should certainly be the basis of the class-book on materia medica.

The second winter session should, I conceive, be entirely given up to surgical and medical anatomy and to physiology. The student would have got a good general knowledge of anatomy, but he would now commence to apply it to his future profession. By surgical anatomy I mean not only the anatomy of the important surgical regions as commonly understood, but such matters as the position of the bones in dislocations as shown on the skeleton, the most usual places of fracture, the position of the bones, and the action of the muscles in such fractures, &c.: in fact, in an easy way the surgical teaching would commence. So also in medical anatomy, the position of the organs to each other, and to the surface; the relation of the parts of the organs to each other; the indication of the parts most commonly diseased; the method of laying bare the parts in making a post-mortem examination, and other points of the like kind, should be gone through practically in the dissecting-room. In this way medical education would be commenced. These practical classes might well occupy two or three hours daily during the entire session, and if subjects could be procured in sufficient numbers, more time might be occupied in regional dissection. The remaining three or four hours of the day, making five or six in all, should be given to physiology.

The importance of this subject is so great, that I hope to see the best mode of tuition carefully debated. I venture to think it should commence with the microscopic examination of the tissues, carried on by the student himself, three or four practical lectures being first given on the microscope; and subsequently that the chemical analysis of the bodily solids and fluids should be carried on in a physiological laboratory, each student working at the investigation as in the general chemical laboratory. In this way the student would soon acquire a good practical knowledge of the component parts of the body, and would be prepared for the pure physiological lectures on circulation, respiration, digestion, &c., which could probably follow in the third month. Possibly, as minute anatomy and chemistry would be disposed of in the physiological laboratory, five lectures a week for three months would be sufficient for a general exposition of physiological doctrines, as certain parts would be taken up in detail in the next summer session. At the end of this session the student ought to be well and practically acquainted with normal minute anatomy; he

would know physiological chemistry fairly, and he would have gone through a general statement of physiological laws, and probably have received some instruction in physiological physics. I presume also he would be thoroughly trained in medical and surgical anatomy.

In the second summer session, physiology should be continued, especially in its relation to medicine. For example, the subjects of diet, of development and growth, of the mental and moral manifestations, as far as these are dealt with by physiology, and subjects of the like kind, should be discussed in formal lectures which would run through the whole session, and be supplemented by some practical work in the physiological laboratory. One or two hours a day would be thus occupied, and the remaining three hours should be spent in practical pharmacy and dispensing. In practical pharmacy (which is the supplement to the course on *materia medica*), not only the chief pharmacopœial preparations should be made, but the rules for the purity and strength of drugs should be practically worked out, and, in fact, a course gone through very similar to that conducted at the Pharmaceutical Society. The arrangement for actual dispensing would be a more difficult matter; but as practice during three or four weeks would probably be enough, it would not perhaps be impossible to arrange for the attendance of a certain number of students daily in the hospital dispensaries.

I will bring together, in a short scheme, the proposed arrangements of the subjects and the time :—

Session.	Time.	Subjects and Time.				Total time occupied.
<i>First Winter</i>	{ Oct. to Feb.	{ Anatomy (practical), three to four hours. Chemistry (practical and lectures), two to three hours. }				Six hours daily.
<i>First Summer</i>	{ April to July.	Toxicological Chemistry, an hour and a half.	<i>Materia Medica</i> , an hour and a half.	Physics, an hour three times a week.	Botany, an hour three times a week.	Four hours daily.
<i>Second Winter</i>	{ Oct. to Feb.	Practical Surgical and Medical Anatomy, two to three hours.	Practical Physiology, Microscopical and Chemical, three to four hours.	Physiological Lectures for three months, one hour.		Six hours daily.
<i>Second Summer</i>	{ April to July.	Physiological Lectures and Practical Laboratory work, one to two hours.		Dispensing and Pharmaceutical Chemistry, three hours.		Five hours daily.

By this scheme the student would spend more time in the acquirement of these subjects than he now does. He would do almost everything practically; and it may be confidently anticipated he would be far better instructed than at present. And yet no one can say that he would be overworked. Then would follow the first or primary examination by the licensing bodies in August. In the last two years the student would have to study Medicine, Surgery, Midwifery, Therapeutics, and State Medicine.

II. THE THIRD YEAR.

In the first two years of his medical life, the student has to learn all those subjects which form the foundation of medical knowledge. Those subjects are means to an end, and are only valuable to him when they are so. The fault of some lecturers is, that they attempt to teach exhaustively, without reflecting that their instructions are merely links in a chain, and that they have no right to cover more ground than is useful. In the attempt to learn everything, the students learn nothing thoroughly. The imperfections of the elementary knowledge of even very good students is really astonishing. It is not their fault; it is that of their teachers.

Each subject studied in the two first years is of immense extent, and at present the point to which instruction is carried is uncertain—that is, it is fixed either by the custom of the school, or, more often, merely by the will of the teacher. There surely should be a recognised limit—that is, a selection; and if we select, we must have uniformity. It may be said that uniformity is impracticable, or, if practicable, undesirable. I entirely distrust this opinion; and believing that a selection is necessary, submit that it must be official. It can only be made officially in two ways; either by an agreement on the part of all the licensing bodies that their examinations shall be conducted in particular ways, and shall fall within certain limits; or by regulations framed by the Medical Council, and binding on all medical schools. I can by no means agree with the views of those who would entirely annul all regulations for teaching. I cannot see how medical education could be

carried on without them. Instead of less regulation, I would have more, only it should be effective.

In the last two years the student has to master what is to be the business of his future life—viz., medical and surgical practice. The period is more disproportionate to the work than the first two years are to the elementary subjects. There is all the more necessity then, in this period also, for a general agreement as to what he should learn, though the difficulties of coming to such an agreement may be great. To attempt to teach the student everything—to believe that he can acquire in two years the full extent of subjects which tax all the powers of the most experienced men to comprehend,—can only lead to disappointment. Is it not a bitter sarcasm upon our system that the Medical Officer of the Privy Council has to ask the assistance of the Medical Council to procure him men properly instructed in the eutaneous phenomena of vaccination—that is to say, in one of the most elementary parts of medical education? How are we to interpret such a request? Must it not be that both teachers and examiners have been busy in the wrong direction, and that simple, thorough instruction in the rudiments of practical medicine has been neither given nor tested? I speak from some experience of examinations when I say that a considerable, though inaccurate knowledge of difficult subjects, in medicine is often combined with a singular ignorance of very simple points. I have no space to analyse the reasons of this state of things, which are, however, obvious enough. I must pass on to what I conceive to be the best mode of teaching medicine, surgery, and midwifery in the last two years, premising, however, that I am less familiar with the proper modes in the two latter subjects.

The third year should, I believe, be entirely occupied with medicine and surgery, properly so called; midwifery and some other subjects being deferred to the fourth year.

The students of the third and of the fourth years respectively ought not to be mixed up; they are in different stages of instruction, and their classes should be separate.

In the October of his third year the student has no knowledge of medicine and surgery, except what has been suggested by some of the practical courses. In fact, he has no business to have such

knowledge, as his time ought to have been thoroughly occupied with the elementary subjects. The first thing should be to give him a good foundation by means of short elementary courses of perhaps six weeks' duration, in which he should be told the definition of medical and surgical terms, the names of the more common diseases, their symptoms and their nature, stated as briefly and simply as possible. I believe these explanatory and very elementary courses to be most important, and, in fact, to be the basis of further accurate knowledge. They should, I think, not be given by the same lecturers who deliver the longer courses on medicine and surgery, to which they should be an introduction. They should be, as far as possible, tutorial; and the student should commit them to memory, and be tested at every point. He should not be permitted to enter the hospital until he had gone through them. A course of this kind on medicine would take one hour a day, and it should be supplemented by two practical elementary courses, each taking another hour, so as to make the medical work for the first six weeks three hours daily.

These two elementary sub-courses should practically teach the methods of physical examination (*i.e.*, the stethoscope, pleximeter, laryngoscope, sphygmograph, &c.) and the elementary characters of skin diseases by models and plates, and the characters of abnormal urinary conditions. All these points are now taught in the hospital; they would be far better comprehended if taught out of the hospital in regular tutorial classes. To take auscultation, for example: it is in reality a very easy matter; but it is always an embarrassing subject to the student, because after perhaps a few formal lectures, or even without them, he is told to listen in the hospital to sounds which he does not know practically, and often not even theoretically. Before he enters the hospital he ought to have thoroughly studied by actual practice all the healthy sounds of the lungs and heart, and thus have formed a clear standard of comparison; and he ought to know by description or actual practice the characters of the morbid sounds he will be told to listen to. As it is, under the present system, weeks, and sometimes months, elapse after he has entered the wards before he has mastered the rudiments which a different system would have taught him in a week.

The advantage of commencing the study of skin diseases on models and plates, before looking at patients, is very great. In a patient a disease is often in all forms: appearing, matured, fading. It is most puzzling for a young student. But show him the simple elementary characters, and then trace it upon a well-prepared wax model, and it is learnt at once. During this time he would have been attending for two or three hours daily analogous classes in surgery. A course of definitions and symptoms should be supplemented by practical courses on bandaging and minor operations for which his previous anatomical training would have prepared him. At the end of six weeks the elementary training in medicine and surgery would be ended, and the student would enter the hospital fully prepared to profit by all he sees there.

In every hospital there are two departments, that of the in-patients and that of the out-patients.

Perhaps I may not find at first many to share my opinion, but I believe that the out-patient department should be kept entirely for the advanced students. As at present carried on, the system works in this way: A young student goes into the out-patient room; he sees a great number of patients rapidly passed over; he is confused by the number, and perplexed at the rapidity of the decisions. He has none of that insight and power of rapid induction which the physician, or even the advanced students, have acquired by practice; he learns probably only the belief that his examination may be superficial, and his judgment hasty. I believe nothing is better for training advanced students than an out-patient department, but it is almost useless for a beginner. Instead of sending him there, I would propose he should only attend the wards, and that small classes should be formed, consisting only of men of the same standing, who should be systematically taught to observe the cases. At present a student in the wards attends what physician he likes and when he likes. There is often no regular system or rules of attendance. Classes should be assigned to each physician, who should be furnished with a list, and should see that every man is present daily. In this first year's attendance a student would have the three and a half remaining winter months and the four summer months for ward work; and, supposing there are three physicians, he should go for one-third

of the time to each. The clerks and dressers should be selected from the third-year's men, and be appointed for shorter times than at present, so as to allow more men to profit by these offices.

I do not think it would be advisable to lay down any invariable rules as to the modes of teaching in the hospital. It should be understood that an hospital physician thus engaged has two duties before him. The first is to his patients, who enter the hospital to be relieved or cured, and who should be his first consideration. The second is to the students, who come to be taught. A third duty, which is incumbent on all—namely, to improve our knowledge of the disease and of its means of cure—should for the time be subsidiary. If the student is to be taught, the physician cannot at the same time prosecute original inquiries. The want of distinguishing between these incompatible duties, and of recognising the impossibility of doing both at the same time, is, I believe, the reason of the failure, as teachers, of some most able and original physicians.

As regards the method of teaching, this much is certain—that the student should be obliged to do a great deal for himself. Mere talking and lecturing at the bedside is often open to the objection that it is uncertain how much has been taken in. I have heard many students speak most highly of the classes which Dr. Bennett used to have at Edinburgh, where first one and then another student examined a case before a class; and of Dr. Gairdner's classes at Glasgow. The system pursued by Dr. Russell Reynolds at University College Hospital, where each student has a case given to him, and examines it according to a given form, which, when filled up, is read over and corrected, is also very useful. But whatever plan be adopted, all the students should join in it; it should be compulsory; and the physician ought to see that every one who is ordered to attend the class goes through the regular course of instruction. In all except the largest schools the classes would be small and manageable, as no student would attend more than one course at a time; and in the larger schools, which are in my opinion under-officered, the number of physicians might be increased.

In the surgical wards a similar system should be carried on, and the hours should be so arranged that the student should not only be able, but be obliged, to attend both medical and surgical

clinical instruction. About two hours' medical, and two hours' surgical hospital work, including clinical lectures (which ought to be shorter and more demonstrative), would, I believe, be sufficient; and if during seven months (three winter and four summer) every student went through this systematic training, he would have acquired a very considerable amount of the best kind of experience, and he would have been exercised in the most precise and useful methods.

At the same time, however (*viz.*, in the three last winter and four summer months of the third year), he ought to attend formal lectures on medicine and surgery. The elementary courses would much relieve those lectures, and allow them to commence at once on a higher level. In the hands of a really practical physician or surgeon, who steadily kept in view his object—*viz.*, to give those students destined for general practice an epitome of the most important and generally accepted facts and doctrines in medicine and surgery,—seven and a half months for each subject would be ample time. The student should not be required to attend this course twice, but as it would last seven months and a half, and he would have previously attended the elementary courses for one month and a half, he would in reality receive much more formal medical and surgical teaching than he does now, when he attends the same course of six months twice over. During the summer months it would be possible, I believe, for the professor of surgery, whose course would be less long than the medical course, to give up two lectures weekly for morbid anatomy and chemistry.

The very important subject of morbid anatomy appears to me to be the least known of all by the average medical student, and yet it and pathological chemistry are the real bases of pathology. In assigning two lectures a week during the summer to these two subjects, I am giving them scant allowance. Still, something could be done if both classes are conducted practically. Morbid anatomy is, as I receive it, a knowledge of the characters of diseased tissues. The student will already have studied practically with the microscope the structure of healthy tissue; he should now do the same with diseased parts. I have seen in the class of my colleague, Prof. Aitken, at Netley, how easily and how well men learn in this way; and I feel convinced that morbid anatomy can be effectually taught on no other plan. Were it possible indeed to

do so without detriment to other subjects, it should come earlier in this year's course; but it would be difficult to bring it into the winter session, as every hour would be then wanted in preparing for and going through the bedside training.

The study of morbid chemistry (to use a convenient phrase) is more difficult in all ways, and perhaps at present this should be quite elementary, and be limited to a few lessons on practically detecting the presence of the more important chemical deviations from the healthy standard. The total work during the third year would be six hours daily, and in addition there would be attendances at operations and post-mortem examinations, which should be compulsory, and would add something more to the work.

A scheme of this kind would have the great advantage of compelling every student to go regularly through the training. He could not be absent, and he could not neglect one part for another which he likes better, as is often the case now. The means of testing his progress would be less easy than in the subjects of the first two years. The attention at the formal lectures could be tested by compulsory written examinations at the end of the winter and summer sessions; and possibly his clinical knowledge might be examined in some way before the transference from one physician to another. But the greatest safeguard for attention to hospital work will be when the licensing bodies institute really good clinical examinations in medicine and surgery; as soon as that is done, there will be no laxity in attending hospital.

On looking at this scheme for the third year, I think few will deem it impracticable. It changes our present arrangements very little. It only systematises and regulates what is at present, in many schools, in some disorder. It would make the most of the hospital by properly preparing for it, and by thoroughly utilising every case. The student must be indeed incapable who would not have at the end of the year a very considerable knowledge of medicine and surgery, and would not be ready for the more difficult and more strenuous exertions of the last year.

III. THE FOURTH YEAR.

In the scheme of medical tuition which I am proposing, the whole of the third year is given up to medicine and surgery, and the work of the student is concentrated on these two subjects. There should be nothing to divert his attention, and for the purpose of giving the greatest amount of time to practical work, the formal lectures are reduced to two daily. I look upon this arrangement and on the system of hospital training by the most exact methods in the wards, as the most important part of the plan.

I presume the student would enter on the fourth year fully instructed in the best mode of examining patients, able to make a good diagnosis, and possessed of the methods of treatment most approved by his teachers. Now will be the time to give him the benefit of the immense field of the out-patients. The benefit will not be only his, but will extend to the patients. Few will affirm that our present out-patient system is satisfactory; at any rate with medical patients. At many hospitals the work is overwhelming, and has to be despatched with a celerity that is certainly unbecoming, if not dangerous. The patients, too, are often kept waiting for very long periods, and in many cases must suffer serious discomfort, if not injury. The whole system needs remodelling, and the means of doing so are ready to our hand.

The fourth-year's men should be divided into classes, and assigned to each out-patient physician. On them should fall the task of receiving and examining the patients, while the physician's duty should be merely one of reference and superintendence.

Supposing, for example, an out-patient goes to the hospital for the first time; a roster will give the student's name under whose care he is to be, and who at once would examine him, and report his opinion and the treatment he proposes to the physician. That patient should be then under the charge of the student, who must be answerable for him, and who should, if necessary, attend him at his own house. Each student would thus gradually get twenty to thirty patients, who would be under his particular care. After his ward-training he could surely be trusted, and, besides, he has

always his teacher behind him. He would soon acquire an experience which the mere ward work can never give him. Not to speak of the personal responsibility, which will greatly heighten his interest in his work, and of the varied kinds of cases, he will gain a knowledge of the conditions surrounding sick people in their houses, and of the mode of dealing with them, of incalculable advantage.

The system I propose would, in fact, be very like the German plan, which is known to work well. Such a plan would require good organization, and in keeping the rolls and books there would be a good deal of clerical work, which should be provided for. I do not think it would lighten the duties of the physician or assistant-physician; on the contrary, it would increase them; but then it would be easy, and indeed advantageous, for all the great hospitals to augment the junior staff.

The care of the out-patients would take up much of the student's time, but he would also be able to attend the wards, and should do so, but should have no class-work there. I would propose to devote the whole of the fourth winter to this medical and surgical work, and to midwifery. I believe there will be a great advantage in delaying midwifery till this period. The student will be much better prepared than if he had attended it in the previous summer. It should commence, I conceive, with a simple short course on labour, and delivery, and the early management of the child. As soon as this is over, the student should at once begin attending cases. The present system seems already well organised, and perhaps little alteration is needed in it, except to increase the amount of supervision. The practical midwifery work ought to go on through the whole winter and summer session. After the short course on labour is over, the professor of midwifery would continue the lectures on the diseases of women and children, which by common consent are separated, and properly so, from the general lectures in medicine.

Properly to work at the medical and surgical out-patients, to attend midwifery cases and midwifery out-patients, may seem a hard winter's work, but then there will be only one daily lecture.

The summer session of the fourth year would be the hardest of all. I would propose to relieve the student from all obligatory hospital work (either outside or in), except the attendance on

midwifery cases, which he should still continue. His time will be fully occupied in attending lectures on some subjects which he will be now able to properly appreciate.

There are three subjects which should, it seems to me, be left till the last, and be treated in daily formal lectures running through the four months of the summer session. The first of these is therapeutics. *Materia medica* and practical pharmacy will have been gone through in the first and second years; but therapeutics, so often joined with them, can only be efficiently dealt with when a knowledge of physiology, medicine, surgery, and midwifery has been gained. By therapeutics I do not understand merely the effect of internal remedies, but of all influences, external or internal, dietetic or pharmaceutical, medical or surgical, which can be brought to bear on disease. A course of this kind is sorely needed, and it is to the want of it that I believe our non-advance in therapeutics, as compared with other branches, is partly to be ascribed.

The second subject is medical jurisprudence, exclusive of poisons, the chemistry of which would have been previously gone through, and the symptoms and antidotes of which ought properly to come under *materia medica* or medicine. All other matters which come into courts of law would be placed under this head.

The third subject is hygiene and State medicine. Under the term of State medicine my friend Mr. Rumsey would include all medical matters which come before the law courts representing the State. This is no doubt logically correct, but there is, I think, a convenience in separating forensic cases, and in using the term State medicine as expressing all the relations between medical men and the State, except those which necessarily come before legal tribunals. If in the course of physiology the application of physiological truths to health were laid down—if, for example, the effect of diet, of exercise, of mental work, of habits, &c., on health had been there considered, the purely hygienic course might be short, and there would be time to consider the important topics of the health of communities, the action of laws and customs on them, the influence and regulation of trades, the care of the indigent sick, and such like topics, which form the domain of that part of State medicine which is not forensic.

To these three important subjects should be added a practical

course on operative surgery. Properly, this should have come sooner ; but there is a convenience in taking it in the summer, when subjects are more plentiful, and the anatomical rooms are vacant.

The accompanying table gives the arrangement for the last two years.

Session.	Lectures.	Hospital.	Total Time Occupied.
<i>Third Winter.</i>	{ Elementary Courses on Medicine for six weeks, three hours daily ; ditto in Surgery for six weeks, three hours daily. Advanced Course on Medicine for three months and a half, ditto Surgery, two hours daily.	In-patients and Clinical Lecture four hours daily for three months and a half.	{ Six hours daily.
<i>Third Summer.</i>	{ Advanced Course on Medicine, ditto on Surgery, two hours daily.	In-patients, Clinical Lectures, &c., four hours.	{ Six hours daily.
<i>Fourth Winter.</i>	{ Course on Midwifery, one hour.	{ Out- and In-patients, and practical Midwifery, four to five hours.	{ Uncertain : five to six hours daily.
<i>Fourth Summer.</i>	{ Courses on Therapeutics, Medical Jurisprudence, Hygiene, and State Medicine, and Operations, three to four hours.	Practical Midwifery.	{ Uncertain : five to six hours daily.

Four years spent in this way—four years of systematic and regular training, the effect of which should be thoroughly tested in the schools as well as by the licensing bodies—would ensure a very fair knowledge on the part of every student.

I will not enter into any argument in defence of this scheme. Some parts of it will probably commend themselves ; others may be thought more doubtful ; but all parts of it will, I hope, receive consideration. I proceed, however, to notice certain consequences which would follow its adoption, and which may perhaps be considered difficulties.

1st. Every student must now pass four years in professional study, but he need not spend all this time at a medical school. He may take a salaried situation for a year or more, and therefore it would be a pecuniary loss to compel him to spend four years at a school and to exclude him from a situation. I am uncertain how many students would be thus affected ; but surely

if four years' school study is necessary—and I firmly believe it is,—the interests of these students must give way for the general benefit.

2nd. The medical schools would be put to some expense in providing increased accommodation in laboratories, chemical and physiological ; in the stock of chemicals and apparatus ; in larger drug museums, in microscopes, and other appliances of the kind. I think we may fairly call on the medical schools to provide this increase of stock. In fact, all the schools have greatly increased their material appliances during the last twenty years ; and this is merely a step onward, demanded by the progress of our subjects.

3rd. Though there is less formal lecturing in this scheme, there are more teachers. There would be division of fees, but perhaps no actual increase. The chemical and anatomical fees would not be increased ; the physiological would probably be larger for the year, but then the second year's fees are saved. A course on physics is added, but botany is lessened in amount. The medical and surgical lectures are for one year instead of two, and the saving would probably pay for the short practical courses. Midwifery remains much as it was, and hospital practice is altered in form, but not in extent or expense. The lectures on therapeutics would be saved in the course of materia medica, but there might be some additional expense in the pharmaceutical laboratory. The course on forensic medicine would be of the same length as at present ; while the hygienic course would be new. On the whole, without prejudging a point which could only be arrived at from careful calculation by teachers on each subject, I do not think there would be any material increase of the aggregate cost.

4th. The augmentation in the teaching staff, providing, as it would do, for practical and tutorial classes, would have to be met by the introduction of young physicians and surgeons—assistant professors, so to speak—who would thus become trained in teaching and ready to take the higher posts. I believe that this would be an unmitigated good, and that the introduction of young blood in this way would be of service to all schools. The payment of these courses would, however, lessen the profits of some of the long courses ; but as few men lecture for direct gain, perhaps no objection would be raised to this.

5th. As the scheme contemplates a selection of topics in some subjects, and uniformity to a certain extent in all schools, there must be some understanding as to the limits of tuition. In medicine, surgery, midwifery, and perhaps physiology, this would not be necessary, as the objects would be gained if a particular mode of teaching and of testing results were adopted. But in chemistry, botany, physics, materia medica, and perhaps one or two other subjects, official text-books current in all schools would have to be framed. Some may think this hazardous, as tending to introduce a system which may be difficult of modification or expansion, or which may deter independent teachers from bringing forward original manuals or systems of teaching.

Several plans present themselves for obviating this objection. The Medical Council might undertake the preparation of such text-books. The Pharmacopœia has been compiled by a number of experts, working under and directed by a committee of the Council. Why in the same way should not some of the leading chemists, botanists, &c., be called upon to prepare good text-books, under the advice of the Council? As no profit would be desired, and the expenses would not be great, these text-books would be supplied to students very cheaply, and they might be revised, as the Pharmacopœia is, every three or four years. If this plan be held to savour of monopoly, any text-book published by any teacher in a school might be submitted to the Medical Council, and receive its sanction, and after that be current in that school, or any other that chose to adopt it. But such a plan is not so likely to gain the end. If it be held that the preparation and compulsory use of official text-books on these subjects is undesirable, the only other plan I can perceive is, that the Medical Council should, in conjunction with all the licensing bodies, lay down specific rules as to the extent to which these subjects should be taught, but leave the individual school to work out the recommendation in its own way. This has, in fact, been found necessary by the University of London in some of the subjects of the medical examination. In the preliminary scientific examination, the subjects in mechanical philosophy, natural philosophy, chemistry, botany, and zoology are all selected; and in the first M.B. examination, organic chemistry is also thus defined. I think discussion is wanted on this point. For my own part, I prefer at

present the first plan, as more likely to attain the desired result—viz., to give the student the training best fitted to make him a good medical practitioner.

I must refer, in conclusion, to one other point. Would it be sufficient to leave medical education entirely unshackled by any regulations as to place or order of subjects, and to trust to the searching nature of the examinations for licences to ensure a sufficient education? This view has been urged with great vigour by a teacher to whose opinions I attach the greatest weight; and yet I find myself, in this instance, unable to agree with Mr. Simon, if I rightly apprehend his position.

With our present system of licensing by numerous competing bodies in all parts of the kingdom it is impossible to ensure such a thorough examination as is contemplated by Mr. Simon. If, indeed, there was one central body for the whole kingdom, organised in proper disregard of those distinctions of race and boundary which all men should desire to efface, we might, perhaps, look for a thorough and searching test. But I fear such a millennium is not for our generation. Even if we had one grand national licensing body, and, therefore, complete uniformity of examination and knowledge, would it be less necessary than it is now to define the successive steps by which medicine and surgery, and all the underlying subjects, can be best learnt? There must be a right and a wrong way in setting to work, and an advantage in studying one subject before another. Who is to indicate to the student where he is to begin, and how he is to proceed, and to what length he is to go? Some one must show him, and if the Medical Council or the licensing bodies refuse to do so, their place will be taken by others. But what would be the advantage of allowing this power of direction to lapse from those who are certainly fittest to use it, and of throwing it into the hands of individuals or of schools? It would be merely a transference of action, with a decided chance of loss on the transfer.

Granted that a licensing body, if it can ascertain that a student is fitted for his profession, may consider it immaterial how the knowledge has been gained, still it is impossible to deny that a good arrangement of subjects and system of tuition will greatly lessen the labour of the student, and increase his chance of acquiring the science in a given time. So that, even were the examination

complete, it would still be a question whether an official order of study would not be desirable. But what practical good can result from raising the question now, as it seems to be admitted that, till the examination is complete, it must be supplemented by regulations intended to ensure that subjects have been learnt?

The immediate questions for decision seem to me to be—How can a limited time be most profitably occupied in order to give the best chance of gaining a certain result? What system of teaching is the best, to what length is it to go, and how are the results to be gauged? When these questions have been answered, then surely we may make the answers into laws—into laws, however, which are not unchangeable like those of the Medes and Persians, and not vexatious and frivolous, but laws which represent the carefully considered views of those who are fittest to judge what should be learnt and how it should be learnt; laws, in fact, which should be as sign-posts for the students, telling them how best to reach their goal. To regulations of that kind I hardly think it would be wise to object.

IV. SCHOOL TESTS OF PROGRESS.

A teacher ought to be sure that he has taught. How should he ascertain this? How should he make clear—1st, that he is himself not going beyond the limit of practicable teaching; and 2nd, that his pupils have got what he wants them to get from his tuition? He can only do this in one way,—by frequent examinations.

Compulsory class examinations are essential; they are actually in force in some schools, and they have been recommended in several Reports of the Medical Council.

The point is how to conduct them. Weekly oral examinations were carried on for many years at University College, and I have been present at a great number of them. They appeared to me to fail in consequence of the numerous absentees, the length of time occupied with slow men in getting over the ground, and the consequent small number of students examined. The object aimed at, viz., the testing of every man, was certainly not attained.

I have seen at the Military Medical School at the Val de Grâce,

in Paris, a system something, I presume, like that which Sir William Hamilton instituted in his celebrated class in Edinburgh. At the "conferences" at the Val de Grâce, a subject is given out for discussion some days before the meeting; the professor is in the chair, and his class is assembled as usual. He calls upon a student to speak on the question, and then on another to reply. The names of the disputants are, I believe, noted beforehand, and their statements are prepared. While discussions of this kind are no doubt useful, they yet in no way answer the object now aimed at. Many take no part in them; and it may be questioned whether the plan of allowing students to contest doubtful and obscure points is not a mistake. They should learn only what is trustworthy; difficulties and half-truths will afterwards come soon enough.

Compulsory written examinations are certainly exceedingly good tests; every man is examined, and he is exercised in expression as well as in mere knowledge. We all know also how much more defined our knowledge becomes when we state it on paper; and it is, I believe, much more easy for a teacher to know whether a student clearly understands from a written than from a verbal reply.

Written examinations ought, however, to be very frequent; monthly, or perhaps even weekly. If postponed to the end of a course, they have two disadvantages; a great labour is thrown on the teacher, and if the student is found to be very backward, there is no time for making him go over the ground again. If made more frequent, they might be shorter; and if the answers of any man were inferior, there would be time to compel a re-study of the subject after hours, and to give him another examination. It does not seem necessary that such written examinations should be long. If conducted every fortnight, one hour would be enough; questions being put on the lectures of the period, and being answered as concisely as possible. The labour of reading the answers is not great, as the examination would not be a competitive one; the replies of the best men would be merely glanced at; those of the worst men picked out, and the men themselves spoken to and admonished.

Such written examinations would not, however, be wanted for the tutorial classes; the chemical and microscopical classes, and the practical anatomical, medical, and surgical teaching, might

be tested by practical examinations. They should of course be conducted with system, and the results be properly registered and recorded, on some good plan.

According, therefore, to the subject, written or demonstrative tests, or both, might be applied, and the teacher would satisfy himself that he was not only listened to, but comprehended.

A good system of school examinations can, like good school teaching, be only brought about by general agreement. At present, when there are class examinations, they are left entirely to the teacher, and hardly enter at all into the general programme of the school. There certainly should be a better superintendence than now exists of the class examinations on the part of the governing body of the school, whatever that may be. The teacher should certify to this body the results of his tests, and this opinion should be recorded in respect of every student. A very ignorant or an inattentive man could then hardly pass years at a school without being detected, as is now sometimes the case, and without being brought under the special notice of the authorities.

The reality of the school examinations might be also tested by the licensing bodies. In those Universities, where the professors, assisted by assessors, or examiners appointed for the occasion, are the examiners for the licence or degree, it would be easy not only to superintend the school tests, but to let them to some extent guide the examinations for degrees. In the case of those licensing bodies which draw their candidates from numerous schools, with which their connection is indirect, there might be a system of this kind. If any candidate appears before them and is rejected, his name and copies of his answers might be transmitted to the school from which he brings his certificates. It would soon be seen if any school was inferior in teaching power, or if any individual teacher was not doing his work. Of course no teacher could be made responsible for all the sins of his pupils, but yet if rejections from a particular class were very frequent, some fault on his side might be suspected, and it would give him an opportunity of seeing wherein his teaching was failing.

Such a test as this would necessarily depend on the conscientious discharge of its duties by the licensing body. It is essential that such a body should examine thoroughly and fairly, and that its own tests should do justice to the schools. In objecting to the

view which would throw aside all school regulations, I by no means wish to go to the other extreme, and to consider the licensing examinations unimportant. On the contrary, I believe, that without good licensing examinations, proper school teaching is impossible. The one thing is a complement of the other ; neither can be efficient alone.

That the licensing examinations will become good tests of the schools, we may, I hope, assume. The visitations of the Medical Council have done much, and are having an action which it is impossible to over-estimate. Those visitations will no doubt be continued, and be made year by year more systematic.

But a still more powerful agency is at work, and that is the increased conscientiousness with which men regard the business of life. It is impossible to mistake the increasing power of principles which allow no sham work, and which will destroy any institution which professes, but does not perform. The same spirit of truth which has shattered all round us so many creeds, and which in our own profession has ploughed up so many ancient landmarks, will permit no corporation to fix its seal to what is false. If it examines, it must examine well ; and if it certifies, it must certify the truth. I am well assured that these principles animate many of those who are most prominent in our Medical Corporation, and that very soon it may come to pass that so far from the schools complaining of inefficient examinations, the examiners may complain of inefficient schools. To give my humble help towards the efficient co-operation of all parts of the Body Medical, so that our profession may be as useful as possible, and as influential as its usefulness sanctions, has been the reason why I have made this attempt to suggest some improvements in our plan of Medical Tuition.

